Recall: π is an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ number, which means that the decimal does not \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

For this reason, we often approximate the number π with \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Today we will discover how approximating π affects area and perimeter.

*For each radius, complete the requested information in the table. Do work to the side.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | r=5 | r=7 | r=3.5 | r=22 | r=100 |
| Perimeter using 3.14 |  |  |  |  |  |
| Perimeter using π |  |  |  |  |  |
| Area using 3.14 |  |  |  |  |  |
| Area using π |  |  |  |  |  |

What do you notice about the difference in the perimeter using π and the perimeter using 3.14?

What do you notice about the difference in the area using π and the area using 3.14?

What area the benefits of approximating π (Would you be able to calculate the exact value on your cell phone? How many decimal places of π do you know?)?

What would happen to our calculations if we used 3.1415 instead of 3.14 to approximate π?

*Copy the values from your previous table onto the table below and solve for the missing values.*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | r=5 | r=7 | r=3.5 | r=22 | r=100 |
| Perimeter using 3.14 |  |  |  |  |  |
| Perimeter using 3.1415 |  |  |  |  |  |
| Perimeter using π |  |  |  |  |  |
| Area using 3.14 |  |  |  |  |  |
| Area using 3.1415 |  |  |  |  |  |
| Area using π |  |  |  |  |  |

Predict what you expect would change in the calculations if, instead, you used 3.141592 for π.

Generalize a rule for what happens when you increase the number of decimal places to approximate π.

List at least 3 pros and cons of using approximations as opposed to exact values.

Pros Cons